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NEW SOVIET DATA ON NIGHT-SKY RADIATION

At the January session of the Department of Physicomathematical Sciences, held in Leningrad, Professor S. F. Rodionov read a new paper on night-sky radiation.

In the summer and fall of 1949, a group of workers from the laboratory of photometry at Leningrad University and an optical group of the El'brus expedition of the Geophysics Institute, Academy of Sciences USSR, measured, at heights of 2,200 and 4,200 meters, the distribution of brightness of the infrared component of night-sky luminescence along the celestial arch. By a sensitive electrophotometer with a secondary-electron multiplier, data was obtained for the first time on the distribution of zenith and horizontal brightness in the 1-micron region of the spectrum. This data showed that, no matter what the spectral composition of the radiation studied in the 900-1,000 millimicron region, the excitation of molecules and atoms takes place at considerably greater heights than for all other spectral components of night-sky luminescence known at present. The atmospheric layer radiating in this region of the spectrum is effectively 900 kilometers high.

At the same time, Rodionov and A. L. Osherovich, using a simple electrophotometer with antimony-cesium photocell and light filters, studied the phenomenon of anomalous transparency in the ultraviolet region of the spectrum, which was discovered in 1936 by Rodionov, Pavlova, and Stupnikov with the help of a photon counter. The substance of this effect is that the relative transparency of the atmosphere for shortwave solar radiation of two different wave lengths passes through an extremum. The explanation of this phenomenon, which is observed at various latitudes, takes into account the selective transparency of the permanent layer of atmospheric aerosols next to the earth. The phenomenon of anomalous transparency vitiates Götz and Dobson's well-known method of determining the vertical distribution of ozone from the so-called inversion effect.

The use of a simple electrophotometer to measure the selective transparency of the atmosphere in the ultraviolet region will permit one to conduct proper studies on a large scale.

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